

REMARKS

Claims 1-17 are pending in the application and all of the claims have been rejected. Claims 1-17 remain in the application. Applicants respectfully traverse the rejections of claims 1-17 and seek favorable reconsideration in view of the following remarks.

**The Examiner rejected independent claims 1, 5-7 and 15 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,536,418 (“Breux”) in view of U.S. Patent No. 6,375,413 B1 (“Stones”).** The Examiner asserts that Breux teaches “[a] vacuum pumping arrangement, FIG. 1, having a turbomolecular vacuum pumping means, FIG. 1 (10) C. 1 Line 70, having a motor, FIG. 1 (20) C. 2 Lines 10-11, and a drive shaft, FIG. 1 (12) C. 1 Line 71, [and] an evacuation means, FIG. 1 (33), to evacuate the turbomolecular pump, C. 2 Lines 30-35.” The Examiner concedes that “Breux does not teach a backing pumping mechanism, but [asserts that] Stones...teaches...a backing mechanism, FIG. 1 (1) C. 5 Lines 28-29. The Examiner concludes that “[i]t would have been obvious...to combine the regenerative and molecular drag mechanisms taught by Stones with the turbomolecular pump taught by Breux in order to create a pump capable of greater vacuums, C. 1 Lines 57-68 and C. 2 Lines 1-21.”

Independent claim 1 claims “A vacuum pumping system having a vacuum pumping arrangement comprising: a drive shaft; a motor for driving the drive shaft; a molecular pumping mechanism comprising turbomolecular pumping means; a backing pumping mechanism, wherein the drive shaft is for driving the molecular pumping mechanism and the backing pumping mechanism; and an evacuation means for evacuating at least the turbomolecular pumping means.”

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Office to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or non-obviousness of the claimed invention is then evaluated in view of the

results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; *see also KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

The Supreme Court in *KSR* also held that “[t]here is no necessary inconsistency between the idea underlying the TSM [teaching, suggestion, motivation] test and the *Graham* analysis.” M.P.E.P. §2141 (rev. 6, Sept. 2007), citing *KSR*, 127 S. Ct. at 1741, 82 U.S.P.Q. 2d at 1396. Thus, when applicable, as here, TSM reasoning may still be applied, not only by an examiner, but also by Applicant to refute a § 103 obviousness rejection.

Breaux is directed to a system for simulating outer space conditions. The system includes a turbomolecular pump FIG. 1 (10), C. 1 Line 70 for evacuating a chamber FIG. 1 (27), C. 2 Line19. The outlet of pump (10) is “connected to a cyro pump 29, a diffusion pump 31 and a roughing pump 33.” FIG. 1, C. 2 Lines 19-21. The “roughing pump 33 is started to bring the system to approximately  $10^{-3}$  to  $10^{-5}$  torr.” C. 2 Lines 30-33. “The pump 10 is then started, [and] the cryo pump 29 is supplied with coolant...” C. 2 Lines 33-34. Next, “[t]he diffusion pump 31 is...started and the system is pumped to provide a pressure of about  $10^{-12}$  torr...” C. 2 Lines 35-37. The Examiner argues that “[i]t would have been obvious...to combine the regenerative and molecular drag mechanisms taught by Stones with the turbomolecular pump taught by Breaux in order to create a pump capable of greater vacuums, C. 1 Lines 57-68 and C. 2 Lines 1-21.” Applicants respectfully disagree with the Examiner’s assertion.

Applicants respectfully submit that Breaux teaches away from combining its turbomolecular pump with the compound pump of Stones. Indeed, assuming *arguendo*, even if the turbomolecular pump of Breaux could be combined with the compound pump of Stones to for a new vacuum pumping arrangement, the combination would add unnecessary cost and complexity to the system of Breaux. Following the Examiner’s reasoning, the new vacuum pumping arrangement would replace the turbomolecular pump FIG. 1 (10) of Breaux. However, the cryo pump (29), the diffusion pump (31) and the roughing pump (33) would still be needed in order to simulate outer space conditions. Thus, there is no benefit to including a compound pump in the system of Breaux and indeed, Breaux teaches away from such modification because it would just add additional cost and complexity to the system.

In addition, Stones teaches “[i]t was found that...especially the regenerative/molecular drag compound pumps, were generally able to provide a higher ultimate vacuum together with a relatively higher compression ratio than that available with comparable vacuum pumps.” C. 2

Lines 10-14. Stones fails to teach or even suggest that a compound pump having a turbomolecular stage would create a pump capable of greater vacuums as suggested by the Examiner. Indeed, there is no teaching, suggestion or motivation in Stones or Breaux to combine the turbomolecular pump of Breaux with the compound pump of Stones.

Moreover, both Breaux and Stones simply fail to teach or even suggest “a molecular pumping mechanism comprising turbomolecular pumping means; [and] a backing pumping mechanism, wherein the drive shaft is for driving the molecular pumping mechanism *and* the backing pumping mechanism” as claimed in independent claim 1. (emphasis added). Thus, Breaux either alone or in combination with Stones fails to achieve the invention as claimed in independent claim 1.

In addition, Applicants respectfully submit that there is no teaching, suggestion or motivation in Breaux, Stones or the cited art for a vacuum pumping arrangement to have a drive shaft “for driving the molecular pumping mechanism and the backing pumping mechanism” as claimed in independent claim 1. Adding a turbomolecular pumping stage to a compound molecular drag/regenerative pumping mechanism, as suggested by the Examiner, is complex and involves the consideration, addition and arrangement of numerous parts as shown in FIGS 1 and 6-8 of the application as filed and discussed in the Specification Page 9 Line 1 to Page 12 Line 3 and Page 13 Line 16 to Page 14 Line 4 of the application as filed. The Examiner has provided no cited art or explanation that indicates it would take mere ordinary skill in the art to combine the turbomolecular pumping mechanism of Breaux with the compound pump of Stones as suggested by the Examiner. Accordingly, Applicants respectfully submit that independent claim 1 is not rendered obvious by Breaux and/or Stones. Thus, Applicants respectfully request withdrawal of the rejection to independent claim 1.

In addition, the Examiner asserts that “Stones further teaches...wherein the backing pumping mechanism comprises a regenerative mechanism, C. 5 Lines 28-29” as claimed in dependent claim 5. Applicants respectfully submit that claim 5 depends from independent claim 1. Thus, for at least the reasons set forth above, dependent claim 5 is not rendered obvious by Breaux and/or Stones.

Moreover, the Examiner asserts that Stones teaches the “limitations from claims 6 and 15, a molecular drag mechanism, FIG. 1 (2) C. 5 Lines 29-30.” Applicants respectfully submit

that claims 6 and 15 depend from independent claim 1. Thus, for at least the reasons set forth above, dependent claims 6 and 15 are not rendered obvious by Breaux and/or Stones.

The Examiner asserts that “Breux further teaches...[the] limitations from claim 7, an evacuation means for evacuating a vacuum pumping arrangement, C. 2 Lines 30-35.”

Dependent claim 7 claims “wherein the evacuation means is for evacuating the vacuum pumping arrangement.” Applicants respectfully submit that claim 7 depends from independent claim 1. Thus, for at least the reasons set forth above, dependent claim 7 is not rendered obvious by Breaux and/or Stones.

**The Examiner rejected dependent claims 2-3 under 35 U.S.C. § 103(a) as being unpatentable over Breux in view of Stones as applied to claims 1, 5-7 and 15 and in further view of U.S. Patent No. 6,446,651 B1 (“Abbel”).** The Examiner concedes that “[n]either Breux nor Stones teach a processing assembly with a pump, but...[that] Abbel teaches...[the] limitations of claim[s] 2 and 3, [including] a processing assembly, FIG. 1, C. 1 Lines 13-22...for...industry and research to provide a vacuum to create specific atmospheric conditions.” The Examiner reasons that “a semiconductor processing assembly would read on this disclosure, including a pump, FIG. 1 (4) C. 2 Lines 55-56, forming an evacuation means, C. 2 Lines 62-65.” The Examiner further asserts that “Abbel teaches a vacuum pump (4) used as both a forevacuum pump to a turbomolecular vacuum pump (3) and to provide vacuum to a load lock chamber.” The Examiner reasons that “a load lock chamber reads on a gate chamber (2).” The Examiner concludes that “[i]t would have been obvious...to combine the assembly and pump taught by Abbel with the arrangement of Breux as modified by Stones, to create an arrangement using fewer parts, reducing costs and space requirements, C. 1 Lines 40-44.” Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

The Examiner appears to be arguing that the turbomolecular pump of Breux can be combined with the compound pump of Stones and then the chamber (1) of Abbel et al. can be substituted for the chamber (27) of Breux in order to achieve the invention as claimed in dependent claim 2. Applicant respectfully disagrees that Breux, Stones and/or Abbel et al. achieve the invention as claimed in dependent claim 2.

As discussed above with respect to independent claim 1, from which claim 2 depends, Breux teaches away from combining its turbomolecular pump with the compound pump of

Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed in independent claim 1. More specifically, and contrary to the Examiner's assertions, the combination of Breaux with Stones would add unnecessary cost and complexity to the system of Breaux. Further combining Abbel et al. with Breaux and Stones would not result in "using fewer parts, reducing costs and space requirements" as suggested by the Examiner. Accordingly, there is no teaching suggestion or motivation to combine the teachings of Abbel et al. with those of Breaux and Stones.

Dependent claim 2 claims "wherein the vacuum pumping arrangement forms part of a semiconductor processing assembly and the evacuation means comprises a pump associated with the semiconductor processing assembly." (emphasis added). Notably, neither Abbel et al., Breaux nor Stones teach that "the vacuum pumping arrangement forms part of a *semiconductor processing assembly*" as claimed in dependent claim 2. (emphasis added). Moreover, Breaux is directed to simulating an outer space environment, whereas Abbel et al. generally teach that "[a] major portion of all chemical and physical processes, which take place in industry and in research, can be conducted only in vacuum..." C. 1 Lines 14-16. Applicants respectfully submit that Breaux and Abbel et al. are directed to solving different problems. In addition, there is no teaching, suggestion or motivation in either Breaux or Abbel et al. to substitute a chemical or physical process chamber for a chamber for simulating outer space as suggested by the Examiner. Moreover, adding yet another pump (pump (4) of Abbel et al.) as an evacuation means to the system of Breaux would simply add more cost and complexity with little or no benefit. Thus, Breaux teaches away from Abbel et al. For the reasons set forth above, Applicants respectfully submit that dependent claim 2 is not rendered obvious by Breaux, Stones or Abbel et al. Thus, Applicants respectfully request withdrawal of the rejection to dependent claim 2.

Dependent claim 3 claims "wherein the pump is a pump for a load lock chamber of the semiconductor processing assembly." Claim 3 depends from dependent claim 2 and from independent claim 1, thus, for at least the reasons set forth above with respect to independent claim 1 and dependent claim 2, dependent claim 3 is not rendered obvious by Breaux, Stones and/or Abbel et al.

**The Examiner rejected dependent claims 2-4, 7 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Breaux in view of Stones as applied to claims 1, 5, 6, 7 and 15, and**

**in further view of U.S. Patent No. 4,577,465 (“Olsen”).** The Examiner asserts that “Olsen teaches...a processing assembly, FIG. 1 C. 1 Lines 17-20, forming an evacuation means, wherein a pump, FIG. 1 (38), used as an evacuation means is also used for a load lock chamber, FIG. 1 (16), C. 5 Lines 40-60” as claimed in dependent claims 2 and 3. The Examiner appears to be asserting that the vacuum system FIG. 1 (10), C. 4 Lines 5-7 of Olsen, which does not include a turbomolecular pump, can be substituted for the chamber FIG. 1 (27), C. 2 Line 19 of Breaux in order to render dependent claims 2 and obvious. Applicants respectfully disagree with the Examiner’s assertions.

Applicants respectfully submit that as discussed above with respect to independent claim 1, from which claims 2-3 depend, Breaux teaches away from combining its turbomolecular pump with the compound pump of Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed in independent claim 1. As further discussed above with respect to dependent claim 2, the combination of Breaux with Stones would add unnecessary cost and complexity to the system of Breaux.

In addition, the Examiner asserts that the air ejector FIG. 1 (38) of Olsen is an evacuation means as claimed in claims 1 and 2. However, Olsen simply fails to teach a turbomolecular pump and particularly “an evacuation means for evacuating...the turbomolecular pumping means” as claimed in claim 1 and “the evacuation means comprises a pump associated with the semiconductor processing assembly” as claimed in dependent claim 2. Moreover, it is unclear how the Examiner proposes combining the teachings of Olsen with those of Breaux and Stones. Thus, while the work chamber FIG. 1 (14) of Olsen could be substituted for the chamber (27) of Breaux, there is a question as to where the additional components of the vacuum system (10) of Olsen shown in FIG. 1 would be arranged. Olsen shows the load lock chamber FIG. 1 (16) connected directly to the cryo pump FIG. 1 (12). The air ejector FIG. 1 (38) is connected directly to the load lock chamber FIG. 1 (16). Thus, if this arrangement were employed in the system of Breaux, the load lock (16) would be upstream from the turbomolecular pump (10) of Breaux and not connected to the chamber (14). Accordingly, it does not appear that Olsen can be combined with Breaux. Applicants respectfully submit that even if Olsen could be combined with Breaux and Stones, the combination would not achieve the invention as claimed in dependent claims 2-3. Accordingly, Applicants respectfully submit that dependent claims 2 and

3 are not rendered obvious by Breaux, Stones or Olsen and respectfully request withdrawal of the rejection to dependent claims 2-3.

The Examiner concedes that “[n]either Breaux nor Stones teach a processing assembly with an ejector pump” as claimed in dependent claim 4. However, the Examiner asserts that Olsen teaches that “the evacuation means comprises an ejector pump, FIG. 1 (38) C. 5 Lines 47-48” as claimed in dependent claim 4 and suggests that Olsen also teaches “wherein the evacuation means is for evacuating the vacuum pumping arrangement” as claimed in independent claim 16. The Examiner concludes that “[i]t would have been obvious...to use an ejector pump as taught by Olsen to evacuate the system taught by Breaux and modified by Stones in order to avoid contamination from an oil lubricated pump, C. 2 Lines 20-30.”

Applicants respectfully submit that as discussed above with respect to independent claim 1, from which claims 4 and 16 depend, Breaux teaches away from combining its turbomolecular pump with the compound pump of Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed in independent claim 1. In addition, as discussed above with respect to dependent claims 2-3, it does not appear that Olsen can be combined with Breaux. Moreover, the Examiner asserts that the air ejector FIG. 1 (38) of Olsen is an evacuation means as claimed in claims 1 and 2. However, Olsen simply fails to teach a turbomolecular pump and particularly “an evacuation means for evacuating...the turbomolecular pumping means” as claimed in claim 1 from which claims 4 and 16 depend. Thus, even if Olsen could be combined with Breaux and Stones, the combination would not achieve the invention as claimed in dependent claims 4 and 16. Accordingly, Applicants respectfully submit that dependent claims 4 and 16 are not rendered obvious by Breaux, Stones or Olsen and respectfully request withdrawal of the rejection to dependent claims 4 and 16.

The Examiner further asserts that Olsen teaches the “limitations from claim 7, wherein the evacuation means is for evacuating a vacuum pumping arrangement, C. 5 Lines 40-60. The Examiner reasons that “[i]t would have been obvious...to combine the assembly and pump taught by Olsen with the arrangement of Breaux as modified by Stones, to create an arrangement using fewer parts, reducing costs and space requirements.”

Applicants respectfully submit that as discussed above with respect to independent claim 1, from which claim 7 depends, Breaux teaches away from combining its turbomolecular pump

with the compound pump of Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed in independent claim 1. In addition, as discussed above with respect to dependent claims 2-3, it does not appear that Olsen can be combined with Breaux. Moreover, the Examiner asserts that the air ejector FIG. 1 (38) of Olsen is an evacuation means as claimed in claims 1 and 2. However, Olsen simply fails to teach a turbomolecular pump and particularly “an evacuation means for evacuating...the turbomolecular pumping means” as claimed in claim 1 from which claim 7 depends. Thus, even if Olsen could be combined with Breaux and Stones, the combination would not achieve the invention as claimed in dependent claim 7. Accordingly, Applicants respectfully submit that dependent claim 7 is not rendered obvious by Breaux, Stones or Olsen and respectfully request withdrawal of the rejection to dependent claim 7.

**The Examiner rejected claims 8-9, 13, 14 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Breaux in view of Stones.** The Examiner asserts that “Breux teaches...[a] vacuum pumping arrangement, FIG. 1, having a turbomolecular vacuum pumping means, FIG. 1 (10) C. 1 Line 70, having a motor, FIG. 1 (20) C. 2 Lines 10-11, and a drive shaft, FIG. 1 (12) C. 1 Line 71, a method comprising operating an evacuation means, FIG. 1 (33), to evacuate the turbomolecular pump to a predetermined pressure, C. 2 Lines 30-35, and operating a motor to rotate a drive shaft, C. 2 Lines 33-35” as claimed in independent claim 8. The Examiner concedes that “Breux does not teach a backing pumping mechanism.” However, the Examiner asserts that “Stones teaches...a backing mechanism, FIG. 1 (1) C. 5 Lines 28-29” as claimed in independent claim 8. The Examiner concludes that “[i]t would have been obvious...to combine the backing mechanisms taught by Stones with the turbomolecular pump taught by Breux in order to create a pump capable of greater vacuums, C. 1 Lines 57-68 and C. 2 Lines 1-21.”

Applicants respectfully submit that the same reasoning applied above to independent claim 1 can be applied here, to independent claim 8. As set forth above with respect to independent claim 1, Applicants respectfully submit that Breux teaches away from combining its turbomolecular pump with the compound pump of Stones and there is no teaching, suggestion or motivation to combine Breux with Stones.

In addition, independent claim 8 claims “A method of operating a vacuum pumping arrangement having a drive shaft; a motor for driving the drive shaft; a molecular pumping mechanism having turbomolecular pumping means; and a backing pumping mechanism, *wherein*



*the drive shaft is for driving the molecular pumping mechanism and the backing pumping mechanism*, the method comprising the step of operating an evacuation means connected to the arrangement to evacuate the turbomolecular pumping means to a predetermined pressure; and operating the motor to start rotation of the drive shaft.” (emphasis added). Applicants respectfully submit that both Breaux and Stones simply fail to teach or even suggest “wherein the drive shaft is for driving the molecular pumping mechanism *and* the backing pumping mechanism...and operating the motor to start rotation of the drive shaft” claimed in independent claim 8. (emphasis added). Thus, Breaux either alone or in combination with Stones fails to achieve the invention as claimed in independent claim 8. Accordingly, Applicants respectfully request withdrawal of the rejection to independent claim 1.

The Examiner asserts that “Breux further teaches...wherein the motor (20) rotates the drive shaft (12) when the predetermined pressure has been obtained, C. 2 Lines 30-35” as claimed in dependent claim 9. Dependent claim 9 depends from independent claim 8. Thus, Applicants respectfully submit that for at least the reasons set forth above with respect to independent claim 8, dependent claim 9 is similarly not rendered obvious by Breux either alone or in combination with Stones.

In addition, the Examiner asserts that Breux teaches “wherein the vacuum pumping arrangement, FIG. 1, is evacuated to the predetermined pressure, C. 2 Lines 30-35” as claimed in dependent claim 13. Dependent claim 13 depends from independent claim 8. Thus, Applicants respectfully submit that for at least the reasons set forth above with respect to independent claim 8, dependent claim 13 is similarly not rendered obvious by Breux and/or Stones.

Moreover, the Examiner asserts that Breux teaches the “limitations from claims 14 and 17, wherein the predetermined pressure is 500mbar or less, C. 2 Lines 32-33 set a range of 10-3 to 10-5 torr for the original pressure, these values convert to a value lower the 500 mbar.” Dependent claims 14 and 17 claim “wherein the predetermined pressure is 500 mbar or less.” Dependent claims 14 and 17 depend from independent claim 8. Thus, Applicants respectfully submit that for at least the reasons set forth above with respect to independent claim 8, dependent claims 14 and 17 are similarly not rendered obvious by Breux and/or Stones either alone or in combination.

**The Examiner rejected dependent claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Breux in view of Stones as applied to claims 8, 9, 13, 14 and 17, and in**

**further view of US Patent No. 6,474,949 B1 (“Arai et al.”).** The Examiner asserts that “Breux teaches starting a motor (20) while running an evacuation means, C. 2 Lines 30-34.” The Examiner concedes that “[n]either Breux nor Stones teach limiting the torque of a motor during startup.” However, the Examiner asserts that “Arai teaches...limiting the torque of a motor (40), [and] controlling the speed of the motor.” The Examiner reasons that “it would be obvious that speed and torque are closely related, to avoid an overloaded state, C. 1 Lines 60-65 and C. 4 Lines 5-21.” The Examiner concludes that “[i]t would have been obvious...to combine the pump monitoring method as taught by Arai with the operating method taught by Breux and modified by Stones in order to create a more stable pumping arrangement.”

As discussed above with respect to independent claims 1 and 8, Applicants respectfully submit that Breux teaches away from combining its turbomolecular pump with the compound pump of Stones and there is no teaching, suggestion or motivation to combine Breux with Stones. In addition, as discussed above with respect to independent claim 8 from which claim 10 depends, Applicants respectfully submit that Breux either alone or in combination with Stones fail to achieve the invention as claimed in independent claim 8. Thus, even if Arai et al. could be combined with Breux and Stones, the combination would not achieve the invention as claimed in dependent claim 10.

**The Examiner rejected Claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Breux in view of Stones as applied to claims 8, 9, 10, 13, 14 and 17, and in further view of Abbel et al.** The Examiner concedes that “[n]either Breux nor Stones teach a processing assembly with a pump.” However, the Examiner asserts that “Abbel teaches...a processing assembly, FIG. 1, C. 1 Lines 13-22...for...industry and research to provide a vacuum to create specific atmospheric conditions. The Examiner reasons that “a semiconductor processing assembly would read on this disclosure, including a pump, FIG. 1 (4) C. 2 Lines 55-56, forming an evacuation means, C. 2 Lines 62-65.” The Examiner further asserts that “Abbel teaches a vacuum used as both a fore-vacuum pump to a turbomolecular vacuum pump and to provide vacuum to a gate chamber.” The Examiner concludes that “[i]t would have been obvious...to combine the assembly and pump taught by Abbel with the arrangement and method of Breux as modified by Stones, to create an arrangement using fewer parts, reducing costs and space requirements, C. 1 Lines 40-44.”

The Examiner appears to be asserting that the turbomolecular pump of Breaux can be combined with the compound pump of Stones and then the chamber FIG. 1 (1) of Abbel et al. can be substituted for the chamber FIG. 1 (27) of Breaux in order to achieve the invention as claimed in dependent claim 11. Applicant respectfully disagrees that Breaux, Stones and/or Abbel et al. achieve the invention as claimed in dependent claim 1.

As discussed above with respect to independent claims 1 and 8, Breaux teaches away from combining its turbomolecular pump with the compound pump of Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed. In addition, as discussed above with respect to independent claim 8 from which claim 11 depends, Applicants respectfully submit that Breaux either alone or in combination with Stones fail to achieve the invention as claimed in independent claim 8. Thus, even if Abbel et al. could be combined with Breaux and Stones, the combination would not achieve the invention as claimed in dependent claim 11.

Dependent claim 11 claims “starting the motor before or during evacuation of the turbomolecular pumping means to the predetermined pressure; limiting the torque of the motor to prevent overloading before evacuation; and operating the evacuation means to evacuate at least the turbomolecular pumping means to the predetermined pressure.” Notably, neither Abbel et al., Breaux nor Stones teach that “the vacuum pumping arrangement forms part of a *semiconductor* processing assembly” as claimed in dependent claim 11. (emphasis added). Moreover, Breaux is directed to simulating an outer space environment, whereas Abbel et al. generally teach that “[a] major portion of all chemical and physical processes, which take place in industry and in research, can be conducted only in vacuum...” C. 1 Lines 14-16. Applicants respectfully submit that Breaux and Abbel et al. are directed to solving different problems. In addition, there is no teaching, suggestion or motivation in either Breaux or Abbel et al. to substitute a chemical or physical process chamber for a chamber for simulating outer space as suggested by the Examiner. Moreover, adding yet another pump (pump (4) of Abbel et al.) as an evacuation means to the system of Breaux would simply add more cost and complexity with little or no benefit. Thus, Breaux teaches away from Abbel et al. For the reasons set forth above, Applicants respectfully submit that dependent claim 11 is not rendered obvious by Breaux, Stones or Abbel et al. Thus, Applicants respectfully request withdrawal of the rejection to dependent claim 11.

**The Examiner rejected claims 11, 12 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Breaux in view of Stones as applied to claims 8, 9, 10, 13, 14 and 17, and in further view of US Patent No. 4,577,465 ("Olsen").** The Examiner concedes that "[n]either Breaux nor Stones teach a processing assembly with an ejector pump." The Examiner asserts that "Olsen teaches...a processing assembly, FIG. 1 C. 1 Lines 17-20, having an evacuation means, wherein a pump (38) used as an evacuation means is also used to evacuate a vacuum pumping means, C. 5 Lines 40-60" as claimed in dependent claim 11.

Applicants respectfully submit that as discussed above with respect to independent claims 1 and 8 Breaux teaches away from combining its turbomolecular pump with the compound pump of Stones, there is no teaching, suggestion or motivation to combine Breaux with Stones and the combination would not achieve the invention as claimed in independent claim 8.

In addition, the Examiner asserts that the air ejector FIG. 1 (38) of Olsen is an evacuation means as claimed in claims 8 and 11-13. However, Olsen simply fails to teach a turbomolecular pump and particularly "an evacuation means to evacuate...the turbomolecular pumping means to the predetermined pressure" as claimed dependent claim 11.

Moreover, it is unclear how the Examiner proposes combining the teachings of Olsen with those of Breaux and Stones. While the work chamber FIG. 1 (14) of Olsen could be substituted for the chamber (27) of Breaux, there is a question as to where the additional components of the vacuum system (10) of Olsen shown in FIG. 1 would be arranged. Olsen shows the load lock chamber FIG. 1 (16) connected directly to the cryo pump FIG. 1 (12). The air ejector FIG. 1 (38) is connected directly to the load lock chamber FIG. 1 (16). Thus, if this arrangement were employed in the system of Breaux, the load lock (16) would be upstream from the turbomolecular pump (10) of Breaux and not connected to the chamber (14). Accordingly, it does not appear that Olsen can be combined with Breaux.

Applicants respectfully submit that even if Olsen could be combined with Breaux and Stones, the combination would not achieve the invention as claimed in dependent claims 11-13 for the reasons set forth above. Accordingly, Applicants respectfully submit that dependent claims 11-13 are not rendered obvious by Breaux, Stones or Olsen and respectfully request withdrawal of the rejection to dependent claims 11-13.

In conclusion, Applicants respectfully submit that claims 1-17 are not rendered obvious by Breaux, Stones, Abbel et al., Olsen or Arai et al. for at least the reasons set forth above.

Applicants respectfully request withdrawal of the rejections to claims 1-17 so that the application may be promptly passed to issue.

The Office Action contains numerous statements reflecting characterizations about the invention(s), the claims, and the related art with which Applicant does not necessarily agree. Regardless of whether any such statement or characterization is discussed above, Applicants declines to subscribe to any statement or characterization in the Office Action.

Applicant has enclosed a request for a three-month extension of time. Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully Submitted,

Edwards Vacuum, Inc.  
55 Madison Avenue, Suite 400  
Morristown, NJ 07960  
Phone: 973-285-3309  
Fax: 973-285-3320

/Mary K. Nicholes, Reg. No. 56,238/  
Mary K. Nicholes  
Registration No. 56,238  
Attorney for Applicant(s)  
Date: March 30, 2009

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